commodore

semiconductor group

COMMODORE SEMICONDUCTOR GROUP

MOS TECHNOLOGY (N-CHANNEL)	FRONTIER (CMOS)	OPTO (LCD)

SYSTEM ARCHITECTURE
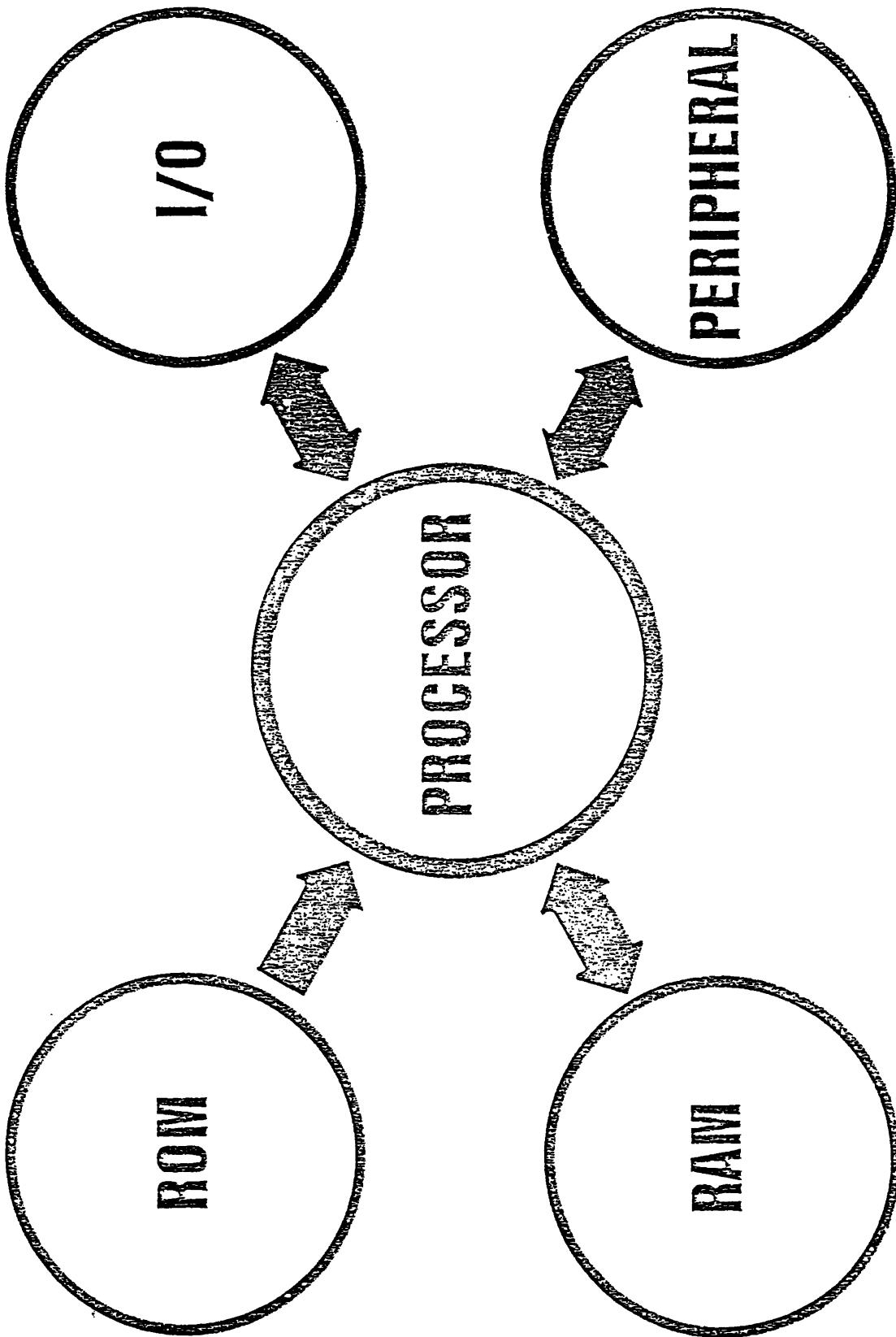
ORIGINAL
6500 N-CHANNEL FAMILY

2364 (64K ROM)
2332 (32K ROM)
2316 (16K ROM)

ROM

6502
PROCESSOR
SERIES

I/O

6520 (DUAL PORT)

PERIPHERAL

6522 (COUNTER, SERIAL PORT, PORT)
6532 (RAM, TIMER, PORT)
6560 (COLOR TV CONTROLLER)

RAM

2114 (4K RAM)
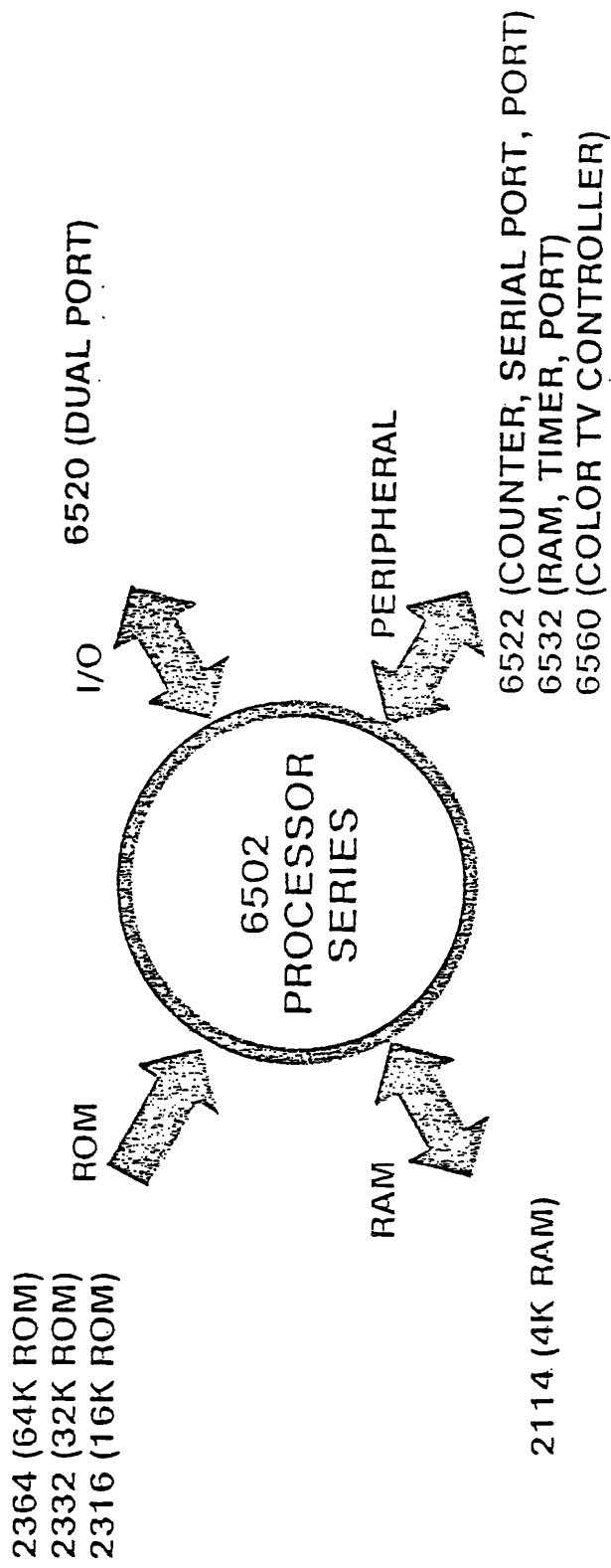
* EXTENDED 6500 N-CHANNEL FAMILY NOW BEING SAMPLED

6502 PROCESSOR SERIES

ROM

I/O

PERIPHERAL

RAM

2364 (64K ROM)
2332 (32K ROM)
2316 (16K ROM)

* 6500/1
* 6508
* 6510

* 6525   (INTERRUPT CONTROLLER, TRIPLE PORT)
* 65245 (TRANSCEIVER)
* 6551   (ACIA)
* 6521   (SINGLE PORT)
* 6523   (TRIPLE PORT)

6520 (DUAL PORT)

6522 (COUNTER, SERIAL PORT, PORT)
6532 (RAM, TIMER, PORT)
6560 (COLOR TV CONTROLLER)

* 6545 (CRT CONTROLLER)
* 6526 (CLOCK, COUNTER, SERIAL PORT, PORT)

2114 (4K RAM)
* 6118 (8K RAM)

INITIAL
CMOS 6500 FAMILY
(INTRODUCTION IN 1981)

23C16 (16K ROM)

ROM

65C23 (TRIPLE PORT)

I/O

65C02 PROCESSOR SERIES

PERIPHERAL

65C26

(CLOCK, COUNTER, SERIAL PORT)

RAM

C2114 (4K RAM)
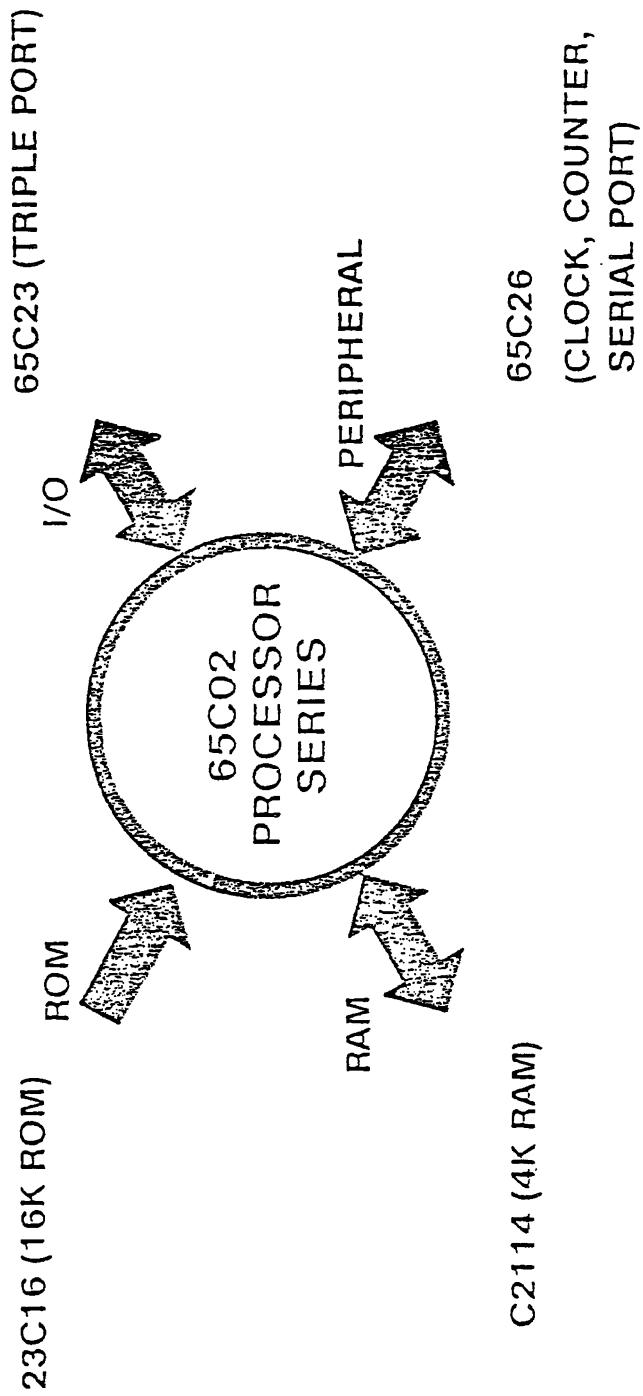
PROGRAMS IN DEVELOPMENT 1982

1. EXTENDED CMOS FAMILY

   - 23C32 32K ROM
   - 65C25 (TRIPLE PORT)
   - REAL TIME CLOCK

2. ENHANCED VIDEO

3. SOUND CHIPS

4. EPROM SERIES

   - ROM
   - PROCESSOR COMBINATION
   - PERIPHERAL COMBINATION

5. HIGH SPEED 6500 SERIES

6. 16-BIT MICROPROCESSOR

COMMODORE ADVANCED MICROPROCESSOR

THE COMMODORE/MOS TECHNOLOGY 16 BIT MICROPROCESSOR
IS A NEW GENERATION PROCESSOR. IT UTILIZES THE
MOST RECENT ARCHITECTURAL TECHNIQUES OF ADVANCED
MAINFRAME COMPUTERS. THIS ALLOWS THE PROGRAMMER
TO WORK AT MACHINE LEVEL WITH A HIGH LEVEL LANGUAGE
AND AVOIDS THE TYPICAL ASSEMBLY LANGUAGE PROGRAMMING
THAT IS CUMBERSOME, TIME CONSUMING AND COMPLEX.

FEATURES THAT ARE INCLUDED ARE:

- REFRESH CONTROL FOR DYNAMIC RAMS
- DESCRIPTIVE DATA TYPES
- 24 BIT ADDRESS SPACE
- I/O CONTROL
- MEMORY MANAGEMENT
- SUPPORT FOR ERROR CORRECTION

ADVANCED PROCESSOR DESIGN GOALS

1. POWERFUL PROCESSOR THAT OFFERS TO 16 BIT
   MARKETPLACE WHAT THE 6502 GAVE TO 8 BIT

2. CONSUMER ORIENTED, LOW COST

3. TRUE 16 BIT, NOT PSEUDO 16 BIT

4. LARGE MEMORY SPACE

5. ORIENTED TOWARD HIGH LEVEL LANGUAGES

6. DESIGNED FOR MULTI-USER AND NETWORKING

7. FULL SUPPORT

   operating system

   high level languages

   development systems

WHY DO WE PUSH TO ADVANCE TECHNOLOGY?

1. COST REDUCTION

   THE SAME DEVICE MADE SMALLER
   IS CHEAPER TO PRODUCE

2. LARGER SCALE OF INTEGRATION

   MUCH MORE COMPLICATED SYSTEMS
   CAN BE CONSTRUCTED ON A SILICON
   CHIP THAN WAS PREVIOUSLY POSSIBLE

3. IMPROVED PERFORMANCE

CREATION OF AN LSI CIRCUIT

1. CONCEPT   DESIGN

2. ARCHITECTURE

3. CIRCUIT DESIGN

4. LAYOUT

5. COMPUTER SIMULATION

6. DIGITIZING   CAD

7. EDITING

8. PATTERN GENERATION

9. RETICAL GENERATION   MASK SHOP

10. MASK GENERATION

CREATION OF AN LSI CIRCUIT

11. WAFER PROCESSING   WAFER FAB

12. PARAMETER TEST

13. PROBE TEST   WAFER TEST

14. SAW AND BREAK   ASSEMBLY

15. LEAD BONDING

16. FINAL TEST   TEST AREA

17. QA AND SHIP

LIGHT

MASK

SILICON
WAFER
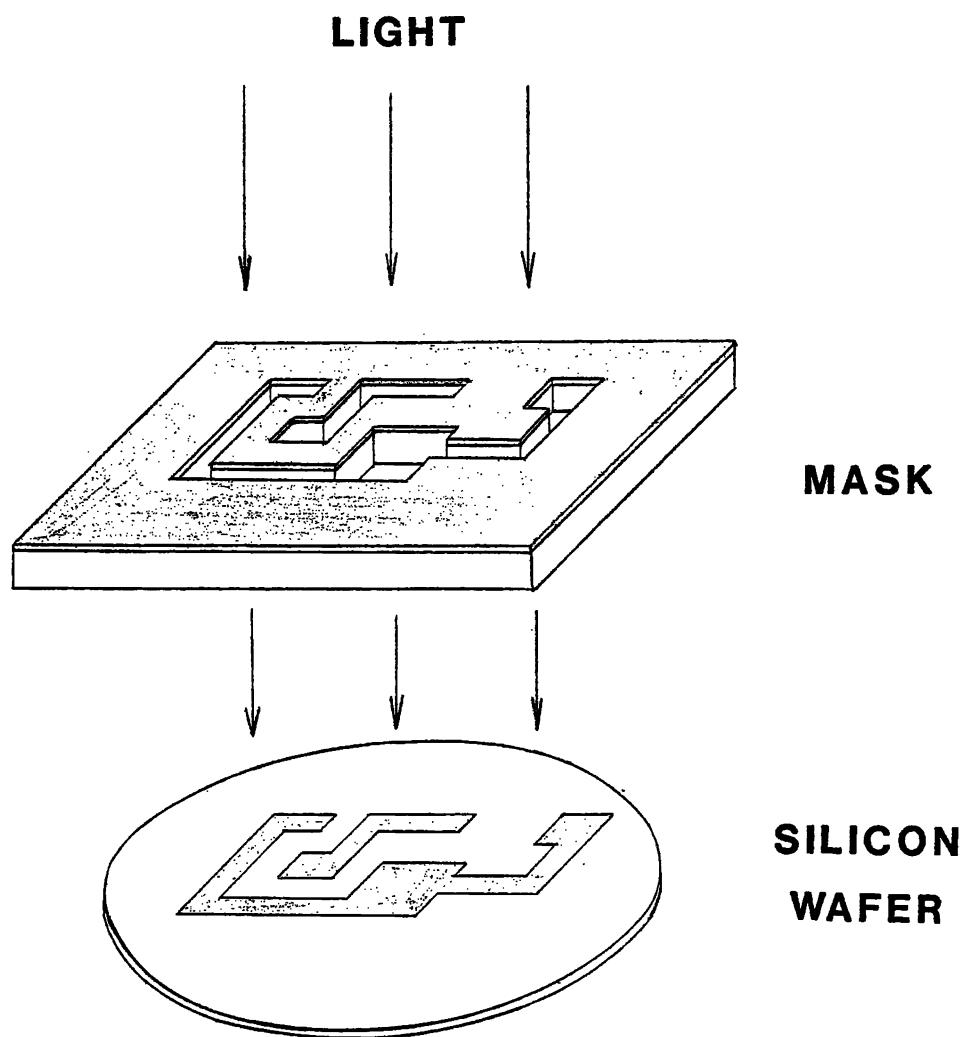
PHOTOLITHOGRAPHIC PROCESS

COMMODORE VERTICAL INTEGRATION

SALES

SYSTEM MANUFACTURING

DISPLAYS

ENCLOSURES

SYSTEM DESIGN

PROCESS ENGINEERING

PRODUCT ENGINEERING

INTEGRATED CIRCUIT DESIGN

ADVANTAGES OF
VERTICAL INTEGRATION

1. **DESIGN INTERACTION, CREATIVE INTERFACE**

2. **EYE ON THE MARKETPLACE**

3. **ECONOMIES OF SCALE**

    systems

    integrated circuits

4. **FAST PRODUCT TURN-AROUND**

5. **SHARED RESOURCES AND EXPERTISE**